

Improved Estimates of Site Index Curves Using a Varying-Parameter Model

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ABSTRACT. Current methods for developing site index curves from stem analysis data or from remeasured permanent plots commonly regress height on age (or age and site) using a nonlinear regression model fitted to the pooled observations. While this is a computationally efficient method, it does not satisfactorily account for between-tree differences in individual tree height growth. This paper presents a varying-parameter (linear random regression coefficient) model that is derived by fitting height growth models to each individual tree in the data set. A weighted least squares technique is then employed to combine these individual estimates to form a mean estimate of the parameters of a sigmoid height growth model. These parameters are then used to predict the height development of site trees. An example of the procedure is given using stem analysis data from primarily dominant trees in the young-growth mixed conifer forests of California. FOREST SCI. 31:248-259.

ADDITIONAL KEY WORDS. Stem analysis data, sigmoid model, height growth.